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09/512,817	02/25/2000	Kazuyoshi Kawaguchi	1115-0008-2	6700

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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
KUMAR, SRILAKSHMI K	

ART UNIT	PAPER NUMBER
2675	20

DATE MAILED: 06/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/512,817	Applicant(s) KAWAGUCHI ET AL.	
	Examiner Srilakshmi K. Kumar	Art Unit 2675	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 April 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,5-10,13,16-18 and 21* is/are rejected.

7)☒ Claim(s) *3,4,11,12,14,15,19 and 20* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. 17 .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

The following office action is in response to Amendment C, April 15, 2004. Claims 1, 4, 6, 7, 8, 16, 17, 20 and 21 have been amended.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 5-10, 13, 16-19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruckmongathan (Paper, 1988 International Display Research Conference, *A Generalized Addressing Technique for RMS Responding Matrix LCDs*) in view of Ito et al (US 6,084,563).

As to independent claim 1, Ruckmongathan discloses a driving method for a liquid crystal display device, the method comprising, selecting simultaneously a plurality of lines of row electrodes (abstract) in a liquid crystal display device comprising a plurality of row electrodes and a plurality of column electrodes (Ruckmongathan discloses matrix LCD in Introduction, page 80, left col. lines 23-25) and applying predetermined voltages to the selected lines of the row electrode during a selection period (page 80, left col. lines 57-67), wherein, the selection period of a display frame is divided (Figs. 1 and 2, abstract, page 81, left column), and column electrodes are driven with a voltage pattern by reducing a number of changes of voltage levels in each of the divided selection periods. Ruckmongathan does not disclose where in the selection period of at least a display frame is divided into selection period, the predetermined

voltages are applied to the lines of row electrodes during the divided selection periods, and the column electrodes are driven with a voltage pattern by reducing a number of changes of voltage levels in each of the divided selection periods. Ito et al disclose in col. 10, line 67-col. 11, line 15 and in col. 16, lines 34-41, where the selection period may be divided into a plurality of intervals within one frame period. It would have been obvious to one of ordinary skill in the art to incorporate the feature of divided selection periods of Ito et al into that of Ruckmongathan as both systems disclose similar liquid crystal displays, further, the feature of Ito et al is advantageous as shown in col. 11, lines 10-15, where it makes it possible to maintain brightness and prevent a reduction in contrast.

As to independent claim 8, limitations of claim 1, and further comprising, a method for a display device having display elements in a matrix form and producing voltage levels for effecting a gradation display, the method comprising: setting a time of at least one frame period to be different from that of another frame period (Figs. 1 and 2, T1 and T2), in a plurality of continuous display frames; dividing the selection period of at least one frame in the plurality of display frames into divided selection periods (Figs. 1 and 2, pages 81-82), and providing on-data and off-data in the selection period of the non-divided frame period and the divided selection periods to produce a plurality of voltage levels, and wherein the plurality of voltage levels are used for a display except for the voltage levels in the vicinity of highest and lowest voltage levels (Figs. 1 and 2, pages 81-82).

As to independent claim 16, limitations of claim 1, and further comprising, the driving device comprising a driving means for driving column electrodes according to a predetermined voltage pattern in each period formed by dividing a selection period of a display frame so that

the divided selection periods have a different time ratio (Fig. 2, different voltages are shown, V0 to V3).

As to independent claim 17, limitations of claim, and further comprising, a timing control means which forms a combination of at least one of two continuous display frames in which the time ratio of a display frame period to the other is within 50 – 90%, and supplies a timing signal to column drivers for driving column electrodes (Figs. 1 and 2, T1 and T2), so that a selection period of at least one of the two continuous display frames is divided into two portions to produce an n (n: an integer of at least three) number of divided periods (Table 1), a gradation processing means for producing n-bit gradation data based on inputted image data to write the n-bit gradation data in frame memories, and a column data producing means for producing column data by reading sequentially the n-bit gradation data which are stored in the frame memories in the respective divided periods and supplying the produced data to the column drivers (page 81).

As to independent claim 21, see limitations of claims 1, 8, 16 and 17.

As to dependent claim 2, limitations of claim 1, see limitations of claim 17, above.

As to dependent claim 5, limitations of claim 2, and further comprising, wherein on-data and off-data are mixed in each of the divided periods in two sets of combination of the two display frames to effect a gradation display by pulse width modulation (Fig. 2, and page 81).

As to dependent claim 6, limitations of claim 1, and further comprising, wherein an imaginary row is formed in addition to the lines of row electrode; a selection period is divided into a plurality of divided periods; a voltage pattern is changed so as to reduce a change point of voltage level applied to column electrodes in the one selection period, and a gradation display is

effected by applying voltages to column electrodes according to the changed voltage pattern (page 83, right col. lines 3-20).

As to dependent claim 7, limitations of claim 1, and further comprising, wherein an imaginary row is formed in addition to the lines of row electrode; a selection period is divided uniformly into a plurality of divided periods; a voltage pattern to be applied to column electrodes is determined, and a gradation display is effected by applying voltages to column electrodes with use of a voltage pattern in which there is a single change point of voltage level to be applied to the column electrodes in one selection period (page 83, right col. lines 3-20).

As to dependent claims 9 and 13, limitations of claims 8 and 10, and further comprising, wherein among the plurality of voltage levels, voltage levels in the vicinity of the highest level and the lowest level are used relatively rare and voltage levels in an intermediate region are used relatively often (page 81).

As to dependent claim 10, limitations of claim 8, and further comprising, wherein the method is used for driving a liquid crystal display device wherein a multiple line simultaneously selecting method is used (abstract).

As to dependent claim 18, limitations of claim 17, and further comprising, wherein the timing control means produces the timing signal so that the total time to of the continuously displayed two display frames is equal to a time of an input frame to which image data are inputted (Figs. 1 and 2).

As to dependent claim 19, see limitations claims 6 and 7, above.

Allowable Subject Matter

3. Claims 3, 4, 11, 12, 14, 15, and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

4. Applicant's arguments with respect to claims 1, 8, 16, 17 and 21have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Srilakshmi K. Kumar whose telephone number is 703 306 5575. The examiner can normally be reached on 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, xxxx xxxx can be reached on xxx xxx xxxx. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Srilakshmi K. Kumar
Examiner
Art Unit 2675

SKK
June 12, 2004

DENNIS-DOON CHOW
PRIMARY EXAMINER